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Visual Perception in Reading Readiness

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VISUAL PERCEPTION IN READING READINESS

One of the most important developments of the current century is suggested by the phrase "reading readiness". Reading readiness can be defined as a state of general fitness or maturation which, when reached, allows a child to learn to read with normal expectancy of success. This modern concept of readiness is based on the combination of mental, personal, and physical factors. There follows a brief discussion of these characteristics in the order in which they have been listed.

Learning to read is actually a test of mental ability for it involves intelligent understanding and use of language, the capacity to associate meanings with word symbols, to choose correct interpretation of the meaning from several possible alternatives, to anticipate meanings in a sequence of ideas, to remember ideas in sequence, to think logically, and recall word forms. Studies have been made of the relation between subsequent achievement in reading and time of beginning systematic instruction. These show that average children need the mental maturity of six years and six months before beginning reading.

It is chiefly through language performance that a teacher can make certain assumptions about the mental maturity of the learner. A child's verbal interpretation of a

picture gives the teacher the opportunity to observe several aspects of language development in a single, simple, informal test. The vocabulary, both listening and speaking, grows with increasing familiarity with language. New words are heard, understood, and used in a child's experience with his family and playmates. During the pre-reading program it is especially important to develop a feeling for sentence structure and to help children learn to use complete sentences. The ability to set a clear, pleasant pattern of speech should be a requisite for a teacher in the primary grades for children are highly imitative of speech qualities. They speak what they hear spoken.

The intellectual and social environments with which the child is surrounded influence greatly his personal development. A child usually makes better progress in school when he has had many opportunities to visit different places, has had experiences with pictures and storytelling, and has enjoyed expression with crayons, paint, or clay. Children from the lower social class homes where there is little stimulation for learning are likely to enter the first grade with negative attitudes toward schooling or with false conceptions of school life. An unstable home life during the child's early years may make it quite impossible for him to meet the new and difficult situations without emotional strain. It is

especially important that a child's early efforts in reading should go well and result in feelings of pleasant satisfaction and self-esteem. A child's desire to read depends upon what his past experiences with books have been and whether he has learned to enjoy them. Lack of desire may keep children from achievement even though they possess all the other necessary qualifications to learn. This condition is often observed of the privileged child who has been pampered at home. Desire may influence participation in group activities in which good work habits need to be developed. Reading is an exacting task. Some of the work habits required are: listening with full attention, sitting quietly in a group, following instructions, and responding when given a turn.

Good general health is a factor of primary importance. The process of learning to read requires a well developed body, particularly with reference to a child's nervous system. Ears need to be adequate for picking up sounds of oral language. By the age of school entrance there are wide differences among children in their experience with and sensitivity to sounds. Few children of this age have had training in applying their knowledge of sounds to language--to compare likenesses and differences in sounds of words, or to listen for beginning and ending sounds within the total auditory impression of a word. Long before children are called upon

to attack unknown printed words by phonetic or structural analysis, they should be laying down the foundations of success through adequate opportunities to develop auditory skills. Normalcy of speech is closely related to auditory acuity. A child with a speech defect may show any of the following characteristics in his speech: lisping, hesitating, baby talk, thickness, lolling, stuttering, and errors in speech sounds.

Eyes play a great part in the physical aspect of learning to read. Eyes must be developed to the point where printed symbols both in books and at the board can be seen clearly. Often children see distant objects without muscle tension but experience blurring at near vision. Beginners have limited visual adaptation and are more apt to be farsighted than nearsighted. Some do not have the necessary visual accommodations, eye coordination, and fusion to distinguish word forms and symbols clearly. The processes of visual perception will be treated in some detail in the remainder of this paper.

Over the years experimental psychology has advanced a number of theories in explanation of the total process of visual perception. In a relatively recent explanation in keeping with the earlier behavioristic school of thought, Anderson states:

> The perception of unfamiliar words requires greater attention to the detailed composition of the word. Children who are just learning to read typically ignore the pattern, principally because all words are relatively unfamiliar to the inexperienced reader. The rank beginner is prone to identify words with certain compelling or dominant letters. The pattern materializes only through practice. What seems to happen is that, with practice, the response of recognition gradually enlists more and more of the detail until finally the word is organized as a unit and the perception of it is complete.[1]

Those who follow this way of thinking believe that the beginner will look for dominant cues in recognizing a word. Many experiments have demonstrated three main types of cues: individual letters, small letter groups, and word shape or form. Anderson adds:

> In past work, the cue value of the individual letters has been closely identified with their relative legibility. The argument which has been advanced in this connection is that the most legible letters stand out and so capture the reader's attention and control his response to the word. From this standpoint, the letters which have been assigned the highest cue value include the first and last

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[1]Anderson and Dearborn, The Psychology of Teaching Reading (New York: The Ronald Press Company, 1952), p. 202.

> letters of the word, the few letters which fall directly on the fixation point or area of clearest vision, the capital letters, and the ascenders and descenders, which are high or low letters like b, d, p, and q.[2]

One of the discoveries made between 1879 and 1910 is a fundamental basis upon which some of the modern methods of teaching depend. In describing this discovery, Gates and his associates say that the following has been revealed:

> One need not see distinctly all of the letters, or even all of the words, in an 'eyeful' to recognize the group of words. This discovery lead to new methods in which were emphasized learning to recognize words as total configurations instead of letter by letter, learning to read by getting meaning directly from perception of the symbols without the intervention of oral reading or complete articulation of words.[3]

This view of "whole" versus "parts" controversy is the concern of other psychologists. Hartmann points out:

> Another important psychological truth about reading as a mental function appears in the apparent paradox that children can learn to read without knowing the individual letters of the alphabet. It is, of course, highly desirable that the order of the alphabet be eventually acquired, but these letters are best differentiated from the word totals in which they are originally embedded. The entire visual complex of 'boy' can be perceived and properly pronounced without the ability to analyze the word into

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[2] Ibid., p. 178.

[3] Gates, Jersild, McConnell, Challman, Educational Psychology (New York: The Macmillan Company, 1942), p. 351.

> such components as 'b plus o plus y'. The same is true of much longer and rarer words.[4]

The short sentence has the maximum of meaning to the child and the alphabet signs the least. The word or sentence method of teaching has now all but universally supplanted the older alphabetical technique. It is only when the child himself seeks to write or spell a word that the analysis into letter components must be made.

The word itself as the unit of perception is not all that is involved in the configurational point of view. Wheeler explains that perception is an involved psychological phenomenon in which man is reacting to a totality of stimulation. He says:

> The awareness or perception of a single object in the configurational view, is not conditioned alone by light reflected from the object to the eye, but by light reflected also from the surroundings. The surroundings constitute a setting which plays an important part in aligning the energy-patterns of the brain in such a way that the object takes on its form.[5]

Dolch relates this Gestalt psychology to the reading

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[4]George W. Hartmann, Educational Psychology (Chicago: American Book Company, 1941), p. 442.

[5]Raymond Wheeler, The Science of Psychology (New York: Thomas Y. Cowell Company, 1929), pp. 348-49.

process. He believes:

> First, a group of stimuli caused by black letters on a white background strike the retina simultaneously. This group of stimuli causes what we may call a perceptual field. That is, the particular pattern resulting from the darks and lights of the letters on the page produces certain associations in the nervous system. These associations have been caused by all sorts of connected past experiences that the pupil may have had and taken together, give a mental picture that we call meaning. The reading process is essentially a blending or fusing of the meaning of each new perceptual field with that of the preceding ones.[6]

Another point where the behavioristic and Gestalt psychologies seem to disagree is in the learning process. The behaviorist would say that learning generally takes place through gradual "trial and error" while a Gestalt psychologist insists that learning is achieved through rather sudden "insight".

At this point it is well to refer to McConnell who declares:

> The terms 'trial and error' and 'insight' describe certain phases of the learning process and fail to describe other aspects. In general, what the one emphasizes, the other neglects. Actually the two have certain important relationships. Although sudden appearances of a correct solution are the most dramatic instances of insight, the Gestalt literature now recognizes degrees of insight. It can be partial or complete, gradual or sudden. The curves of learning which represent partial and gradual insight leading ultimately to complete organization of the response

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[6]Edward W. Dolch, The Psychology and Teaching of Reading (Chicago: Ginn and Company, 1931), pp. 131-32.

> will look very much like the curves which depict the gradualness of learning so characteristic of the 'trial and error' accounts.[7]

It does seem that what the one makes explicit and and dominant the other considers obvious. Wholes and parts are both significant aspects of behavior and should not be treated in separation when learning is considered. Actually both differentiation and integration occur in human growth and learning.

When children enter first grade their eyes are still somewhat undeveloped and largely untrained. They can look at the same place or picture as an adult; and while physically they see the same things, they perceive only partially, thereby often inaccurately. Lamoreaux and Lee discuss seeing as made up of three phases: the physical, the physiological, and the psychological.

> The physical phase consists of the light rays striking the retina. This sets up a physiological stimulus and the second phase consists of carrying this stimulus back to the occipital lobes. The third phase is the one with which we as teachers are most concerned. The child has to learn to which of all the hundreds of physiological stimuli which are physically set up, he should give his attention.[8]

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[7]T. R. McConnell, National Society for the Study of Education, Part II, "The Psychology of Learning" (Bloomington: Public School Publishing Company, 1942) pp. 251-52.

[8]Lamoreaux and Lee, Learning to Read Through Experience (New York: D. Appleton-Century Company, 1943), p. 54.

Here the child learns to notice what he sees and begins to interpret his visual perceptions in relation to himself or to other elements related to cognition.

Learning to read requires maturity in binocular vision and oculo-motor co-ordination. The Betts Ready to Read Tests[9] were constructed to provide an abbreviated means of detecting binocular disturbances which may contribute to visual inefficiency that is sometimes reflected in ocular discomfort and faulty oculo-motor control. The Betts tests of vision were designed to test certain functional aspects of vision; namely, clearness of vision, singleness of vision, and the relationships between clearness and singleness. The beginner must learn to control the muscles of the eyes so that words are brought into focus; in fact, he must learn to jerk the eyes co-ordinately across the line of print in a left-to-right direction. The problem here is not the functions of the eye as a receptive sensory organ only, but the use of the eyes as the means for perceiving objects to be interpreted for meanings and ideas.

Shirley Cowin states that "the immaturity of muscular tissue is a major cause of lack of readiness among five or six-year-olds for formal reading. The fine muscles of their

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[9]Emmett A. Betts, Foundations of Reading Instruction (Chicago: American Book Company, 1946), p. 187.

eyes are not developed to the extent that they are able to read the small pictures found in most workbooks."[10] Thus seatwork which some teachers and administrators hope will produce readiness for reading is actually a form of artificially forced experience that probably has definite limitations in the effect of inducing readiness. Until physical maturation is complete the several workbooks which accompany many of the basal readers may do more harm than good. The use of workbooks and the use of seatwork can not hasten the physical development of young children at this point. It is of importance to mention that the prereading program involves more than putting off reading and turning to other things--there is a direct attempt to ready the child for reading by giving training and practice in prereading skills.

Most authors agree that in the development of keener visual discrimination, maturation contributes more than half to the success of performance. Although a certain level of mental maturity is necessary for beginning reading, this alone does not insure good visual perception. Durrell and Harrington lend support in their study. They made the following observation: "There is growing evidence that success in reading rests more on specific backgrounds of perceptual

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[10]Shirley Cowin, "Reading Readiness Through Kindergarten Experience", Elementary School Journal, October, 1951.

abilities, and that these are relatively independent of mental age."[11]

According to the laws of learning and child development, object discrimination and refinement in making distinctions proceed slowly from the ability to make gross distinctions to the capacity for finer discriminations. The development of perceptual readiness for reading is a part of the child's entire perceptual development, and is a process in itself. In passing it is worthy to note that in an early pedagogical treatise, Huey, reflecting the earlier view of behaviorism, has reported that the act of repeating is of importance. He says:

> Perceiving being an act, it is, like all other things we do, performed more easily with each repetition of the act. Repetition progressively frees the mind from attention to details, makes facile the total act, shortens the time, and reduces the extent to which consciousness must concern itself with the process.[12]

This point of view endorsing repetition and drill is a reflection of an early emphasis on behaviorism in learning.

Development of the ability to make gross discriminations is exercised in the act of telling child acquaint-

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[11]Donald Durrell and Sister Mary James Harris, "Mental Maturity Versus Perception Abilities in Primary Reading", Journal of Educational Psychology, Vol.46, 1955.

[12]Edmond Burke Huey, The Psychology and Pedagogy of Reading (New York: The Macmillan Company, 1908), p. 104.

ances from one another, becoming acquainted with streets so as not to get lost, and performance in similar problematic situations. In dealing with this subject, Tinker states:

> By the time a child has reached first grade he is completely familiar with the differences between a chair and a stool, a box and a ball, or a stone and an apple. Most children can readily distinguish between a triangle and a circle or a square, and furthermore it is doubtful that training to discriminate geometric forms will have an important effect on the ability to discriminate words.[13]

Breckenridge suggests that "Judgments of shape must, like those of size be learned. Oddly enough, we do not instinctively see shape any more than we do size, but rather, we must learn how to react accurately to the factor of shape. ... Children differentiate squares, circles, and triangles first; diamonds, crosses, and more complicated shapes later."[14]

In the world round about, all children see printed matter on signs, newspapers, and books. Teachers and parents can help by showing interest when children make comments about the printed symbols they see in shop windows, on television, or road signs. They should encourage children's questions and help to arouse their curiosity concerning printed matter. This increasing perceptual awareness is a

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[13]Miles A. Tinker, Teaching Elementary Reading (New York: Appleton-Century-Crofts, Inc., 1952), p. 60.

[14]Breckenridge and Vincent, Child Development (Philadelphia: W. B. Saunders Company, 1943), p. 321.

sure sign that the child is ready to benefit from instruction in identifying word forms.

There is strong probability that the symbols look very much alike to them at first. Then some characteristics of printed matter begin to be noticed. The development in regard to printed materials goes on at different rates with different children and finally reaches a point where we can say that the child can tell one word from another. And according to Dolch this point must be reached before real teaching of reading can begin. He adds:

> Perception applied to printed matter is a special area of perception and a very difficult one. Words look very much alike, and often have to be studied very closely. Reading readiness workbooks form an interesting transition from the general perception of any part of the environment to the perception of things in books. These books provide various kinds of exercises, always requiring the child to discriminate in finer and finer ways.[15]

There is agreement among most authorities that training in visual discrimination can begin with pictures. At first the less mature child will be able to do little more than enumerate familiar objects which are found in the pictures. Later they improve in ability to describing and interpreting. Thus the normal growth is from enumeration to description to interpretation. This sequence of development

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[15] E. W. Dolch, Teaching Primary Reading (Champaign: The Garrard Press, 1941), pp. 37-38.

is recognized in the nature of the content of the Revised Stanford-Binet Tests. In Form M, responses to pictures are scored at two difficulty levels, one of which is satisfactory at three years and six months level and the other at five years. Enumeration is passing for the first level, but as stated in the manual, "At this level (Year V) mere enumeration is not satisfactory; there must be either description or interpretation".[16] It is a recommended practice to have children take turns relating stories suggested by large pictures and have them try to recall objects in a picture after it has been removed. Also they may asked to recall an action, such as, "What was the kitten doing?" Memory is a readiness skill underlying comprehension.

Hildreth believes that "beginners should have plenty of practice in naming things in pictures, first because this is a sure means of enlarging vocabulary, and second because this is something they will do with the pictures that accompany the material used in reading lessons."[17] In some of the reading readiness booklets there are sequence stories which accustom the children to moving from one page or pic-

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[16]Terman and Merrill, Measuring Intelligence (Chicago: Houghton Mifflin Company, 1937), p. 336.

[17]Gertrude Hildreth, Readiness for School Beginners (New York: World Book Company, 1950), p. 281.

ture to the next in order to get the plot of the story. These series of pictures have several advantages as background for learning to read. A few of these are: the relating of the sequential story theme by following pictures across the page; providing an incentive for using the eyes independently from the hands; training for the kind of eye control needed in reading; relating visual impressions to language; and forming the habit of left-to-right eye movement. "Does the picture tell a story?" is one of the best criteria for choosing pictures. Frequently teachers make picture cards for stimulating language and developing readiness. Matching pictures offers many opportunities for visual development. In this connection Anderson states that "there are certain prereading abilities which can be recognized and to some extent fostered such as, ... the association of ideas with pictures, the following of sequences of ideas with pictures (as in the comics), the recognition of likenesses and differences in pictures, and then in printed symbols."[18]

There is considerable disagreement as to the part which object discrimination plays in the reading readiness program. Broom holds the following opinion:

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[18] Anderson-Dearborn, The Psychology of Teaching Reading (New York: Ronald Press Company, 1952), p. 89.

> Before a child is ready to read he must be able to discriminate correctly with respect to form, size, and color among objects or symbols that are presented to him. This ability to discriminate should be developed adequately in each child by means of definite training during the prereading instruction period.[19]

It is reported by Vernon that "various experimenters have deduced, from the introspections of their subjects upon the process of visual tachistoscopic perception of conventional designs or drawings of real objects, the existence of a number of stages which progress and develop into one another."[20] By definition, the tachistoscope is an instrument for displaying visual stimuli, which controls the exposure as well as the area exposed.

The Bexley Reading Study was used to prove that seeing, like any other skill is a habit. If this be true, it is susceptible to practice or training. In describing this study which was conducted in Bexley, a suburb of Columbus, Ohio, Maclatchy states:

> To develop the habit of seeing words as wholes, we introduced in February in the first grade a variation of visual-form training. The theory underlying this training is that through practice with as nearly meaningless material as can be found, during very brief exposures, it is possible to improve the individual's ability to see visual form. During the

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[19] M. E. Broom, Effective Reading Instruction (New York: McGraw-Hill Book Company, Inc., 1942), p. 85.

[20] M. D. Vernon, The Experimental Study of Reading (Cambridge: Cambridge University Press, 1931), p. 98.

> second semester, three training periods a week were given in each classroom. ... The reading program in Bexley during the years 1944-46 had several features at variance with common instructional practice. In the first grade there were the peculiarities of the use of experience stories, the development of practice materials, the use of many books arranged in a succession determined by vocabulary difficulty, instruction in small, flexible groups, and tachistoscopic training during the second semester.[21]

In appraisal she goes on to say:

> The children's ability to record after brief exposures the forms or digits shown indicates the perceptual ability they developed and the skill they acquired in speedily writing numbers from memory or copying them from the screen. It is essential to remember that these children were in the first grade and that the correctness of their responses was directly affected by their familiarity with the forms, numbers, and words and their skill in recording them.[22]

In a relatively recent book, Gray summarizes observations and research studies to arrive at the conclusion that "a child must develop the ability to make accurate visual discriminations--to identify likenesses and differences in contour, size, position, sequence, and internal details of pictured forms. He must learn to compare visual forms carefully to find likenesses and differences in them and thus he gradually reaches the point where he carefully compares

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[21]Josephine H. Maclatchy, "The Bexley Reading Study", Educational Research Bulletin, Vol. 24, September, 1946.

[22]Ibid., p. 161.

word forms."[23]

On the other hand, McKee sounds a warning of false application when he concludes:

> Unfortunately, the majority of exercises centers the child's attention upon the problem of distinguishing not between forms of printed words but between large objects such as circles and squares, dogs and cats, monkeys with a tail and a monkey without a tail. Since the discriminatory powers of most children by the time they have entered school has advanced beyond the stage of that needed in making such decisions, ... the type of exercises mentioned above are likely to be wasteful for those children.[24]

Tinker's views on geometric forms have already been mentioned. He is supported in his belief by Hildreth. She believes that some published descriptions of reading readiness training advocate extensive eye training of an artificial type. She maintains that this "artificial training" may not carry over to the task of learning to read, for in reading the child must deal with a specific set of visual forms. Similarly there is considerable question about transfer of training from general form discrimination to discrimination between forms of printed words, many of which are similar except for slight differences in a letter or two.

All of us, consciously or unconsciously, use word-

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[23]William S. Gray, On Their Own in Reading (Chicago: Scott, Foresman, and Company, 1948), p. 132.

[24]Paul McKee, The Teaching of Reading in the Elementary School (Chicago: Houghton, Mifflin Company, 1948), p. 147.

form clues when we meet a new word--their use is part of the normal procedure in reading. To use word-form clues the child must be able first to note likenesses and to identify accurately slight differences in the printed form of words, and second to remember the visual form of a word. Tinker makes certain suggestions for exercises designed to effect improving discrimination of forms and letters:

1. Find and mark out the word that is the same as the sample at the beginning.

   apple-----pail, shovel, cat, monkey, apple

2. In each group of four words draw a line connecting two words that are the same.

rap	rat	book	back
rat	run	book	band

3. Have four or five words in a series, all but one alike. The child is to cross out the one that is different.

   saw, saw, see, saw, saw

4. Present a group of four or five sentences in which one word such as doll is repeated frequently. Instruct the child to cross out the word that is repeated.

5. In all of the above exercises capital or small letters of the alphabet may be used instead of words.[25]

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[25] Ibid., p. 148-50.

McKee makes a few additions to this list:

1. Matching words in one column with words in another column.

2. Practicing in distinguishing between the form of one group of letters and the form of another group of letters.

   Illustration: Marking out words in a row that have the same beginning two letters as a given word.[26]

There are a few qualifications regarding this type of exercise. No effort should be made to teach pupils to read the words. The words and parts of words should be those which the child will meet in beginning reading matter. These exercises should be well graded in difficulty. Use them with discretion for they form only a part of the readiness program for visual discrimination. Perception of words may be undertaken too soon for this is a very advanced stage, and it is a mistake to try to force children to work at this level if they cannot succeed. Vernon objects to using meaningless words in the reading program. He insists that "if the stimulus object contains little of interest to him, as does, for instance, a single word or a collection of letters, his eye will rove round looking for something interesting, and ultimately he may invent something if he cannot find it."[27]

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[26]McKee, op. cit., p. 150.

[27]Vernon, op. cit., p. 142.

Another specific opposition to the above exercises is made by Hildreth who said that "it would seem highly unpsychological to give six-year-olds practice in observing small differences in meaningless word forms when they can see no significance in this task. ... This type of exercise should come after children have done some context reading."[28]

Obviously perceptual readiness cannot function as it should in the learning of reading without the other types of readiness. All must be developed in unity. Some primary teachers will contend that some readiness work such as pasting, cutting, and drawing help to prepare all children for the finer eye-coordination required in reading. With plenty of activity in looking at pictures, pointing out things, doing jig-saw puzzles, and other types of looking with intent to discover something the children will reach the maturity required in discriminating word and letter forms. After a thorough overview one comes to the conlusion that object discrimination has value in aiding the very immature child. All the exercises must be constantly adjusted to every individual child, in an attempt to achieve that ideal situation where the material is easy enough for success, but challenging enough to provoke careful thinking. The teacher's challenge lies in the fact that developing visual skills is a continuous process and seldom does a person reach his limit in improving reading ability.

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[28]Hildreth, op. cit., p. 285.

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